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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER

CHUNG, DANIEL J

ART UNIT PAPER NUMBER

2672

DATE MAILED: 05/05/2004

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/629,415

Applicant(s)

FOWLER ET AL.

Examiner

Daniel J Chung

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 February 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-8, 10-12 and 14-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 6-8 is/are allowed.
- 6) ☒ Claim(s) 2-5, 10-12, 14-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claims 2-8, 10-12 and 14-21 are presented for examination. This office action is in response to the response filed on 2-19-2004.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 2-5, 10-12 and 14-21 are rejected under 35 U.S.C. 103(a) as being unpatentable over Thomson et al (6,501,474) in view of Long et al (6,483,519)

Regarding claim 17, Thomson et al discloses that the claimed feature of a system for traversing and rendering a graphic primitive, comprising: a setup engine [30] that outputs representative values of a graphic primitive; a raster engine [32] that receives the representative values of the graphic primitive and forms therefrom representative pixels, the raster engine having at least a scan module that scans only pixels within the graphic primitive and assigns data values to each of the pixels and a look-ahead module that identifies pixels that are inside of the primitive; wherein the look-ahead module processes [54,56,72,80] successive pixels one at a time using edge functions ["edge functions"] to determine whether a next pixel is within the graphic

primitive; and wherein the scan module [32] scans a pixel previously identified as being within the graphic primitive while the look-ahead module processes the next pixel. (See Abstract, Fig 2, Fig 3, col 2 line 30-col 3 line 10)

Thomson et al does not explicitly disclose that “scanning a pixel within the primitive **while** the look-ahead module processes the next pixel.” However, such limitation is shown in the teaching of Long et al. [“The operation of the edge processing module 400 look-ahead module in recited claims] **during** a scan line render operation [scan module in recited claims] ...”] (See col 11 line 50-53, Abstract, Fig 4) It would have been obvious to one skilled in the art to incorporate the teaching of Long et al into the teaching of Thomson et al, in order to provide “processing graphic objects for fast rasterised rendering” (See Title, Abstract line 20 in Long et al), as such improvement is also advantageously desirable in the teaching of Thomson et al for “producing higher-quality graphics at a given frame rate or faster rendering of a give image.” (See col 2 line15-20 in Thomson et al)

Regarding claim 2, Thomson et al fails to teach that the scan module is structured to perform block mode scanning. However, employing **block traversal algorithms** for traversing and rendering a graphic primitives is well known in an analogous art (See Spec p.3 line 29-31 in presented application), in order to generate the primitives effectively at faster processing time. Therefore, it would have obvious to

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one having ordinary skill in the art at the time of Applicant's invention to include such block mode scanning into the teaching of Thomson et al, as such improvement is also advantageously desirable in the teaching of Thomson et al for "producing higher-quality graphics at a given frame rate or faster rendering of a give image." (See col 2 line15-20 in Thomson et al)

Regarding claims 3 and 4, Thomson et al discloses that the graphic primitive is a triangle, and wherein the representative values are at least one edge function ["edge function"] of the triangle/a longest side of the triangle and slope values for at least one vertex of the triangle. (See Abstract, Fig 2, Fig 3, col 2 line 30-col 3 line 10)

Regarding claim 5, Thomson et al discloses that the scan module is structured to check a next adjacent pixel while processing a current pixel to determined if the next adjacent pixel is inside the triangle. (See Abstract, Fig 2, Fig 3, col 2 line 30-col 3 line 10)

Regarding claims 10-12, Claims 10-12 are respectively equivalent to claims 2-4, and thus the rejections to claims 2-4 hereinabove are also respectively applicable to claims 10-12.

Regarding claim 14, Thomson et al discloses that a data value is assigned to a current pixel within the triangular primitive, and a data value is saved ["frame buffer"; 38]

for a next pixel within the triangular primitive only when the next primitive is within the triangular primitive. (See Abstract, Fig 2, Fig 3)

Regarding claim 15, Thomson et al discloses that data values are assigned only to pixels within the triangular primitive and never to pixels outside of the triangular primitive. (See Abstract, Fig 2, Fig 3)

Regarding claim 16, Thomson et al discloses that the second module forms a plurality of data values for each pixel. (See Abstract, Fig 2, Fig 3)

Regarding claim 18, Thomson et al discloses that each edge function is associated with one particular edge of the graphic primitive and determines whether or not the next pixel in the horizontal direction is within the graphic primitive with respect to the one particular edge. (See Fig 3, col 6 line 40-50, col 6 line 56-col 7 line 4, col 7 line 25-42)

Regarding claim 19, Thomson et al discloses that each edge function returns a positive result if the next pixel is within the graphic primitive with respect to the one particular edge. (See Fig 3, col 6 line 40-50, col 6 line 56-col 7 line 4, col 7 line 25-42)

Regarding claims 20-21, claims 20-21 are similar in scope to the claim 17, and thus the rejection to claim 17 hereinabove is also applicable to claims 20-21.

Allowable Subject Matter

Claims 6-8 are allowed

Response to Arguments

Applicant's arguments received on 2-19-2004 have been carefully considered. However, they do not overcome the previous rejections, which have been maintained. Thus, the finality of this office action is deemed proper.

Regarding claim 2-5 and 10-21, applicant argued that the cited references do not disclose that "scans only pixels within the graphic primitive" in recited claim, as Thompson et al states that "rasterization engine 32 calculates a value...pixel locations in or near the triangle..." (col 4 line 67-col 5 line 2) (See Remark p. 5) However, the above applicant's relies is only part of look-ahead processing in Thompson et al, not part of scan processing. Specifically, as illustrated in Fig 4 (See col 8 line 53-col 9 line 33) of Thompson, only pixels [i.e. 112b-112g, 114e-114f] inside triangle were scanned by rasterization engine. Although, pixel located near the triangle [i.e. 114b] also determined by rasterization engine, such determination step is only part of look-ahead processing in Thompson et al. [i.e. rasterization procedure in Fig 4 of Thomson has same functional steps, as described in Fig 5 of presented application] Also, in response to the applicant argument that the cited references do not disclose "edge functions performed in parallel" (See Remarks p.6), such feature is clearly shown in the

teaching of both reference. (See col 7 line 48-51, col 8 line 20-25 in Thomson, Also See col 10 line 49-53, col 31 line 34-42 in Long et al)

Conclusion

Applicant's response and amendment are not persuasive and the previous grounds of rejection have been maintained. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel J. Chung whose telephone number is (703) 306-3419. He can normally be reached Monday-Thursday and alternate Fridays from 7:30am- 5:00pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael, Razavi, can be reached at (703) 305-4713.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to:


(703) 872-9306 (Central fax)

(703) 872-9314 (for Technology Center 2600 only)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA, Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology Center 2600 Customer Service Office whose telephone number is (703) 306-0377.

djc
April 19, 2004


JEFFERY BRIER
PRIMARY EXAMINER